

R E M A R K S

This Amendment is responsive to the Office Action mailed on November 22, 1996. Claims 41-64 remain pending in the application. Reconsideration and allowance of claims 41-64 is respectfully requested.

The drawings were objected to for the reasons as stated by the Examiner in Paper No. 4. With this response, Applicant has submitted a proposed drawing correction, including a separate letter to the draftsman in accordance with MPEP §608.02(r) and a print showing changes in red ink in accordance with MPEP §608.02(v). As such, Applicant believes the above objection to the drawings should be withdrawn.

The Examiner has objected to the Abstract of the Disclosure. Applicant has followed the Examiner's suggestion by deleting the phrases "is disclosed in a first embodiment. In a second embodiment, the sensor element of the first embodiment" from the Abstract. With this correction, Applicant believes the above objection to the Abstract should be withdrawn.

The disclosure was objected to based on a number of informalities outlined in Paper No. 2. In response, Applicant has amended the specification as indicated above. Applicant believes the objection to the disclosure based on the above informalities has been overcome. Applicant has also made a grammatical correction to independent claim 41.

In reference to claims 45, 46, and 56, the specification was objected to as failing to provide proper antecedent basis for the

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claimed subject matter. Claims 45, 46 and 56-64 were rejected under 35 U.S.C. §112, first paragraph. Further, claims 45, 46, 50 and 56-64 are rejected under 35 U.S.C. §112, second paragraph, for the reasons outlined in Paper No. 4. In response, Applicant has clarified the specification to recite, "The force controller 64 or the STM controller 60 can either separately or together perform the functions of the means for providing a carrier signal 40 and the means for reading and converting the output 42 (shown in Fig. 1)". With this response, Applicant believes the above objections to claims 45, 46 and 56, and the above rejection of claims 45, 46 and 56-64 under 35 U.S.C. §112, first paragraph, and 35 U.S.C. §112, second paragraph, should be withdrawn.

Claims 41-46 were objected to based on the following informality. Re: claim 41, section 2, line 2: the conjunction -- and-- should be inserted after the word "plate". Appropriate correction is required. As indicated above, Applicant has made the appropriate correction. Applicant believes the above objection to claims 41-46 has been overcome and should be withdrawn.

Claims 41, 42 and 45-47 are rejected under 35 U.S.C. §102(b) as being anticipated by Thomas. Claims 43, 44, 48, 49 and 51-52 are rejected under 35 U.S.C. §103 as being unpatentable over the primary reference Thomas as applied to claims 41 and 47 above, and further in view of Slinkman et al. and Burnham et al. (5,193,383). Claims 43, 44 and 48-50 are rejected under 35 U.S.C. §103 as being unpatentable over the primary reference Thomas as applied to claims 41 and 47 above, and further in view of Weissenbacher et al.

Thomas, U.S. Patent No. 5,006,952, discloses a capacitive sensor having a joy stick configuration. The joy stick includes a housing (10) from which projects a control lever 12. The control lever 12 is supported by a diaphragm 14 so as to be manually tilted about axis x and y and translatable along an axis z. The diaphragm is clamped between clamp rings 16, 18 which form part of the housing 10. See, Thomas, column 2:34-42.

Within the housing 10, a metal disc shaped blade 22 is fastened to the bottom end of the control lever 12 via an insulating block 24. The plate 22 is, therefore, tiltable in the x and y direction and translatable along the z axis by means of the control lever 12. See, Thomas, column 2:49-53. Printed on the circuit boards 26, 28 are electrode patterns which form variable capacitors, in cooperation with the plate 22. See, Thomas, column 22:62-64. See also, Fig. 1.

The primary reference Thomas, either alone or in combination with the above secondary references, does not disclose a scanned probe microscope apparatus as claimed by Applicant in independent claim 41 and independent claim 45. In reference to independent claim 41, the Thomas reference does not disclose a scanned probe microscope apparatus having a probe and a scanning head operably arranged for measuring surface properties of a sample, nor does the Thomas reference disclose a scanned probe microscope apparatus which includes a high precision capacitance sensor having a pick-up plate movably mounted relative to a drive plate; means for transmitting force between an object remote from the pick-up plate

and the pick-up plate; and means responsive to the position of the pick-up plate relative to the drive plate for providing an output signal proportional to the relative position.

In reference to independent claim 47, the Thomas reference does not disclose a scanned probe microscope apparatus having a probe and a scanning head arranged for operative engagement of the surface of a sample for measuring a surface property thereof. The Thomas reference does not disclose a scanned probe microscope apparatus which includes a force sensor operably located to measure the surface property, the force sensor having an output signal representative of the measured surface property, wherein the force sensor includes a pair of capacitive transducers, each transducer including a separate drive plate and a shared pick-up plate movably suspended between the drive plates, wherein said pick-up plate is capable of deflection between each of the drive plates; and means for transmitting force from a point remote from the pick-up plate to the pick-up plate. As such, Applicant believes the above rejection of independent claim 41 and independent claim 45, under 35 U.S.C. §102(b) as being anticipated by Thomas should be withdrawn.

Dependent claims 42-46 and 48-55 depend either directly or indirectly upon corresponding independent claims 41 and 47, which Applicant believes to be in allowable form. Accordingly, Applicant believes these dependent claims in combination with the corresponding independent claims to be in allowable form over the art of record, and that the above rejections of these dependent

claims should also be withdrawn.

Claims 56-58 and 60-64 are rejected under 35 U.S.C. §103 as being unpatentable over the primary reference Thomas in view of secondary references Bonin et al., Slinkman et al., and Burnham et al. (5,193,383). Claims 57-59 are rejected under 35 U.S.C. §103 as being unpatentable over the primary reference Thomas in view of secondary references Bonin et al., Slinkman et al. and Burnham et al. (5,193,383) as applied to claim 56 above, and further in view of Weissenbacher et al.

None of the cited references either alone or in combination suggest a high resolution sensor apparatus for use with a scanned probe microscope having a probe and a scanning head operably arranged for measuring surface properties of a sample, as claimed by Applicant in independent claim 56. Again, the primary reference Thomas does not disclose a sensor element or means for providing an output signal representative of the surface property being measured as claimed by Applicant. Further, Applicant's present invention allows deflection of the central plate between the drive plates, while maintaining the central plate generally parallel to the drive plates. Applicant's suspended center plate restricts movement or tilting of the center plate in a second or third direction (such as the x and y axis of Thomas), which is critical for its use as a high resolution sensor in a scanned probe microscope apparatus. In contrast, Thomas teaches a joy stick which is specifically designed to be manually tiltable about a desired axis. As the control lever is manually tilted about a desired axis, the plate 22 is tilted

relative to the electrode patterns on the printed circuit boards. Plate 22 is not suspended by spring means or for deflection between said drive plates as claimed by Applicant.

The Examiner has further applied the secondary references of Bonin et al., Slinkman et al., and Burnham et al. in an attempt to reject Applicant's independent claim 56 under 35 U.S.C. §103. None of the references cited disclose a high resolution sensor apparatus for use with a scanned probe microscope including a sensor element and means for providing an output signal representative of the surface property being measured, as claimed by Applicant. Therefore, as reasoned above, one could not combine the teachings of the primary reference Thomas in view of secondary references Bonin et al., Slinkman et al. and Burnham et al., and arrive at the present invention of independent claim 56.

In considering the question of obviousness, the claimed invention as a whole must be considered. None of the above-cited prior art suggests the desirability of the Examiner's combination in reaching his obviousness rejection. To establish a prima facie case of obviousness, there must be suggestion or motivation to modify the reference or to combine referenced teachings and arrive at the present invention. None of the above-cited prior art suggests or teaches such a combination.

If one were to take the primary reference Thomas in light of the secondary references Bonin et al., Slinkman et al. and Burnham et al., the resulting invention might be some sort of a joy stick type accelerometer which is connected to a cantilever set up. Such

a combination is neither practical nor is it claimed by Applicant.

Dependent claims 57-60 depend either directly or indirectly upon independent claim 56, which Applicant believes to be in allowable form. As such, Applicant believes these dependent claims in combination with independent 56 to also be allowable over the art of record.

In light of the above, Applicant believes that independent claims 41, 47 and 56, and the claims that depend therefrom, define over the art of record. Accordingly, a reconsideration of the above rejections and an issuance of a Notice of Allowance in due course is respectfully requested.

Respectfully submitted,

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By his attorney,

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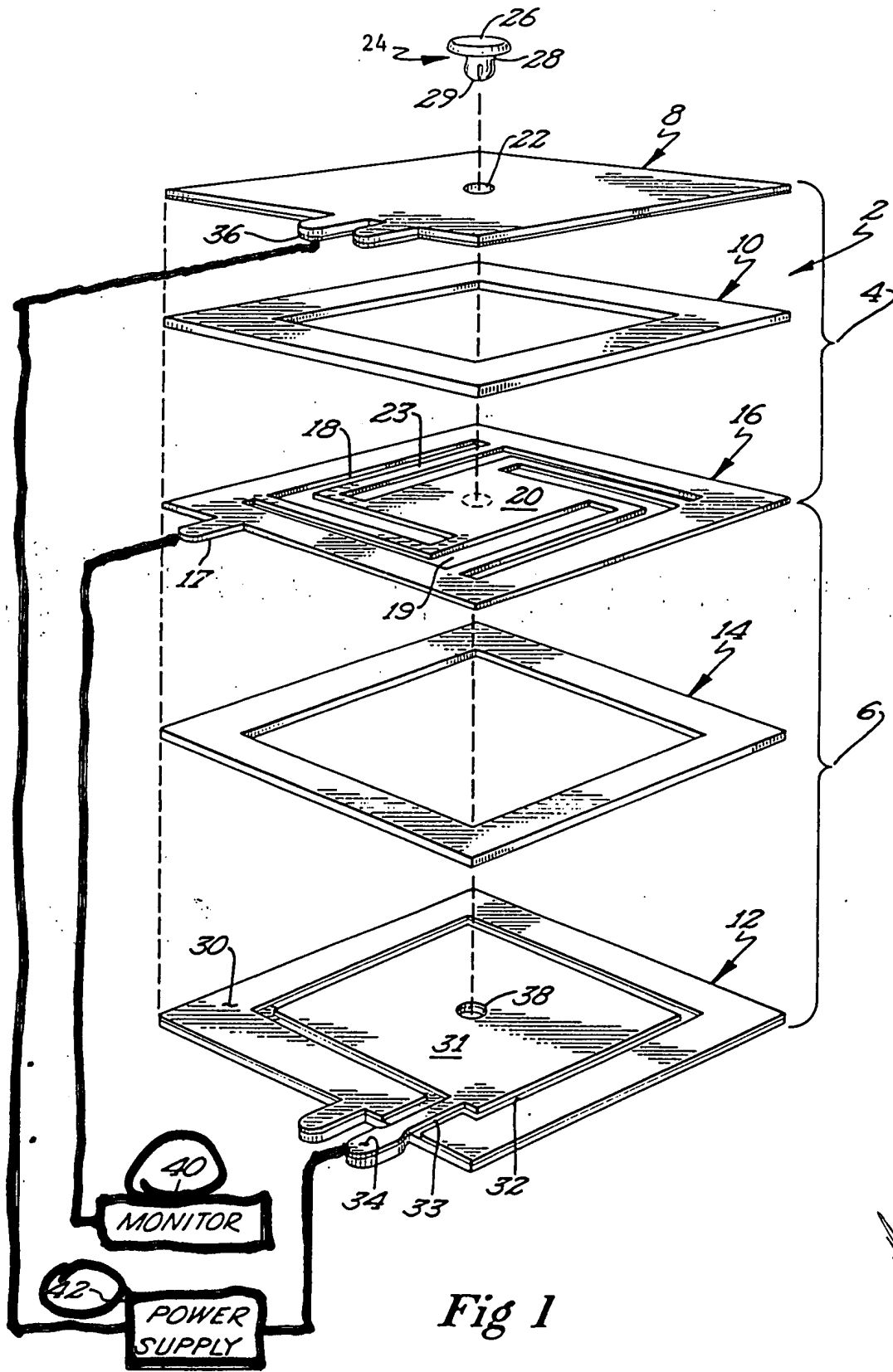


Fig 1

Approved  
 Dan  
 29 April 1957